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Do Class and School Size Matter?

A Crucial Issue to School Improvement

Elizabeth Cornelius
Jacksonville State University

Raffaella Gaines
Jacksonville State University

Tara Gautney
Jacksonville State University

Gresha Johnson
Jacksonville State University

Robyn Rainer
Jacksonville State University

Charles E. Notar
Jacksonville State University
700 Pelham Road NE, Ramona Wood A3
Jacksonville, Alabama 36265
Tel: 1-256-782-5832 E-mail: cnotar@jsu.edu

Shelia A. Webb
Jacksonville State University

Abstract

Students in a first year Master's degree seminar were asked to find the answer to the question "Do Class and School Size Matter as A Crucial Issue to School Improvement?" The paper the students wrote is based on a review of the literature**.** The students determined that the question had several issues to be addressed before they could answer the question. The issues researched were Student to Teacher Ratio, Resource Availability, Test Scores, Minority students, Extracurricular Activities, Attitude, and Security. The research then led them to make a discussion of Class size, Schools within Schools, Small Schools, and Small is not Better.

KeyWords: School size, Large schools, Small schools, School Improvement

Do Class and School Size Matter? A Crucial Issue to School Improvement

1. Introduction

In today's academic world, a question of great significance and controversy looms: Is school size crucial to school improvement? There are some parents and educators who say small schools offer the greatest advantage, and there are

those who maintain that large schools are the only real option for a solid education. In order to decide which size school is best, it is necessary to qualify what is meant by "improvement." For the purposes of this paper, improvement will be defined as consistently raised test scores, lowered drop-out rates, a better overall student attitude towards school and learning, eliminated threats of violence within the school, and a longer lasting scholastic achievement. In order to gauge the overall improvement of a school, our group has studied in great detail the following facets involved in every public school across the nation: student to teacher ratio, resource availability, test scores, minority student placement, faculty's attitudes, security, and extracurricular activities. Although there are findings that support large schools as the way to educate America's youth, the majority of our research proved just the opposite. Our findings acknowledge the possible gains offered by the large schools but support small schools as the leading facet of school improvement. Here is our data.

2. Student to Teacher Ratio

The first issue that generally arises in the large school versus small school debate is the student to teacher ratio. On the average, large schools do have a larger teacher to student ratio. Reducing the number of students in the classroom is not a magical solution, but studies suggest that smaller schools and classrooms create the conditions that improve classroom performance. Specifically, the studies point out, small schools enable closer collaboration among teachers and closer relationships between teachers and students which are factors that improve instruction and make schools more welcoming environments (Rotham, 2003). This can be viewed as concrete evidence when studying particular case studies. Fairmont High School in Ohio is a school of 2,500 students. The administration tried a new tactic for educating the students by incorporating smaller classrooms. In this way, small-scale schooling was used within a large school. The teachers and staff set out to change the climate from one where students felt they didn't belong to one that felt smaller and more welcoming for everyone. The school showed a marked improvement: dropout rates have gone from 32% to 13%, suspensions have declined by 25%, and after school functions attendance has doubled (Schoenlein, 2001). Another study in New York City broke a very large high school into four smaller high schools within the same building. Creating numerous schools within one larger school increased the small school feeling. The results of implementing smaller schools and smaller classrooms within those schools were amazing. Over 90% of the students who begin their schooling at one of the various new schools graduated. Of those graduates, over 95% went on to post-secondary school and did "very well," says curriculum developer Cook. "By all accounts, the new structured school is a huge success," (Hodgetts, 1997). A study conducted by the Toronto Board of Education concluded that students in smaller classes had increased math concept scores and verbal participation. It was found that overall, class size made a tremendous difference to the teachers. They found that with fewer students in the classroom there were less disciplinary problems, fewer interruptions, greater individualized instruction, and more on task behavior (Hollingworth, 1992). There is an interesting correlation between early implementation of small class size versus later implementation as well. It seems if children, particularly impoverished children, are placed in smaller classes early on, their chances drastically improve for academic success throughout their lives (Blatchford, 2003).

3. Resource Availability

A second consideration which often plays a role in the drama between large and small school success is resource availability. Naturally the resource availability differs from large to small schools. Resources may be defined as the money available to the school district to pay teachers and adjunct personnel, to pay for textbooks, supplies, technology, and even the paint for the walls. Additionally, the word resource can apply to uniforms for teams and bleachers for the football field. Overall, the term applies to any expenditure the school incurs. It is a perpetuated idea that larger schools are more efficient because the price to educate each student is dramatically lower than the cost to educate fewer students in a smaller school. According to Cox, in "Big Trouble: Solving Education Problems Means Rethinking Super-Size Schools and Districts," there are a number of factors that must be considered to include: "Teacher and administrator's salaries, school rounds and facilities including desks, lockers, paint, football fields, etc, technological needs and costs of computers, printers, and software, and extracurricular activities which might include uniforms, field paint and goals, swimming pools, theatres, etc," (Cox, 2002). Armed with spread sheets full of figures and factors regarding all the public schools in Utah, Cox set out to determine just how much money is necessary to educate one student in a large school and how much different that amount of money is for a student at a small school. The results were surprising to most. The difference in costs between educating a student at a large school versus a small school is miniscule. In 1999, the Logan school district with 5,840 students had the lowest cost per student (cps) at $181. A school almost half Logan's size, Sanpete, with 2,878 students needed $198 to educate each student. Finally, Juab, a school district with 1,796 students, a number markedly lower than Logan needed $207 per student. The big difference was discovered with an enormous school district with 45,208, Alpine, which required $237 per student (Cox, 2002). In order to further educate himself on the topic, Cox found "paradoxically, the larger a school district gets, the more resources it devotes to secondary or even non-essential activities. As specialization in staff grows, program offerings expand, and administrative personnel increases so do the costs (Cox, 2002). Naturally, the more projects, sports, groups, and clubs offered to the students, there will need to be funding to cover all of it. Additionally, there will need to be teachers to

oversee the activity, and they must be paid as well. Smaller schools that do not offer all the bells and whistles that larger schools do, simply do not need the overhead to cover the extras, and the cost per head to educate can be lowered significantly. Cox's data indicates that there is not a large difference between the cost per student (CPS) in the large school versus the small school. As such, cost should not be a levying tool in deciding which size school is best. If anything, the *uber*-schools are less cost effective than small schools. Chalk another point up in the favor of small schools.

4. Test Scores

Some of the most objective indicators of which size school is most successful are test scores. A study based in Tennessee called the Student/Teacher Achievement Ration Project or Project STAR addressed various grade levels beginning in kindergarten and studied the students within the classes for four consecutive years. The students were broken down into classes of 13-17 students, 22-25 students, and "regular-sized class with a teacher-aid in addition to the teacher," (Robertson, 2001). When the students reached the third grade, they were re-integrated into an average sized classroom. The study sought to find the difference between local, in school test scores, and standardized test scores. The results were telling. In the first four years of the study, the African American students in the smallest classrooms "average test scores increased by 7-10 percentile points, and white students' scores increased by 3-4 percentile points," (Robertson, 2001). In addition, the students who studied for four years in smaller classrooms were more likely to take the SAT or ACT and apply to college. The exact numbers show that African Americans who were always in the regular sized classroom were 31.8% likely to take the college entrance exam, and their counterparts who studied in the smaller classroom were 41.3% likely to take the exam (Robertson, 2001). In Indiana a research group reported that amongst second graders, those in smaller classrooms containing 19 students scored significantly higher on the achievement tests than their counterparts in larger classrooms containing 26 students (Hollingworth, 1992). Together, these studies indicate that young children to high school aged students score higher on standardized testing and local testing when they are placed in smaller classrooms. Since smaller classrooms usually are found in smaller schools, this points to yet another benefit of the small school.

5. Minority students

Minority students are addressed differently in large schools than they are in small schools. There is evidence that reducing class size might be beneficial for minorities and disadvantaged students. To know whether the policy of reducing class size will achieve the intended goal, one must know whether the differential call size-effects for minorities will persist over time or diminish. Again referencing Project STAR, the findings indicate that small classes in the primary grades can help close the achievement gap among minority and majority students. Minority students often experience even greater gains than white students when placed in small classes in the primary school years. Minority students tend to have lower achievement scores than white students before participating in small classes, but they make larger achievement gains by the end of the school year after being placed in smaller classes. In the case of reading achievement, the small class effect for minorities was consistently much larger than for white students in all grades. As in mathematics, the small class effect in reading was larger for boys in all grades. Thus, it appeared that boys had greater lasting benefits from small classes in mathematics and reading than did their female counterparts. Perhaps more important for this experiment, the average lasting effect of small classes was positive and statistically significant (Nye, 2004). Further testing indicated that minority students in inner-city schools, when placed in small classes, improved in their test scores dramatically particularly in the SAT-9 tests (Gilman, 2003). This may be the case because it has been found that minority students are often placed in large classes with under-trained teachers. When comparing that scenario with the small classroom scenario, the results should indicate higher test scores. In the smaller class the student does not stand the chance of falling between the cracks. Instead, he or she can be addressed one-on-one throughout the day by the instructor, and the progress (or lack-thereof) can be quickly ascertained. Needed change can be implemented in a timely manner to best help the minority student in the small classroom.

6. Extracurricular Activities

What happens within the schoolroom is not the only consideration in a school's success; extracurricular activities can play a great role as well. Though larger schools often offer a greater number of after school activities including sports, clubs, theater groups, and band, the largest percentage of students per student body who participate are often found in the smaller school that offers fewer activities. This has nothing to do with the selection, but rather with the perceived student satisfaction. A study was done in the public high schools of Rhode Island. It was found that the students in the smaller high schools had higher attendance, lower dropout rates, higher grade point averages, and a greater satisfaction with their overall high school careers. Furthermore, extracurricular activities were more highly frequented in the small schools than in the larger high schools (Ark, 2002). Ark attributed these findings to the fact that the students were known by name and face within the school hours, and because they were accepted and recognized, they had an overall more confident and satisfied perception of their place within the school. When the students felt they belonged, they also felt they had something they could contribute to the school, whether that be in the band, playing on the sports teams, or

by acting on the stage. Thus higher percentiles of students in small schools became more involved in extracurricular activities (even though there were fewer to choose from) than those in the larger schools in Rhode Island. No matter the offerings of a school (classes, clubs, sports, size), each student must have some self-motivation to be successful and achieve goals (Kleiner, 2001). When combined with the costs of running so many programs that students may not be inclined to take advantage of in the large schools, perhaps small schools enjoy a more successful (and cost efficient) extracurricular program thus adding to the overall success of the school.

7. Attitude

Alluding to the old adage, "If Mama's not happy, ain't nobody happy," such is true where administration and teachers are concerned. In general, the attitude of the school trickles down from the top. That is to say, if the administration is negative, the teachers take their cue from the bosses, and it trickles down further to the students. Therefore, those attitudes held by the administration and teachers must be considered to be top priority. In 1996, studies were conducted on 13,000 Alaskan students and 20,000 Philadelphia high school students. It seems that there was a general feeling of well-being and satisfaction among the faculty in the small schools. That can be attributed to the more human scale, more satisfied and willing students, more committed teachers, opportunity for choice, relative autonomy, distance from bureaucracy, heightened responsiveness to constituents, and better school organization matters (Raywid, 1998). The National Association of Secondary School Principals endorse the idea of small schools. From a survey by Public Agenda Research and Education of 920 public high school teachers and 801 parents of high school students, results are in favor of small schools citing that 66% of parents and 79% of teachers say there is a stronger sense of community at small schools. Also 70% of parents and 56% of teachers say teachers personal interest in students increases at small schools (Johnson, 2002). If teachers feel more responsible to their students in a small school and a stronger sense of responsibility toward the community, then they are apt to take a more conscientious approach towards their teaching than their counterparts in larger schools.

8. Security

Finally, security risks are becoming increasingly worrisome in today's schools. To determine if violence is more prevalent in larger high schools, a series of surveys and samples were studied in Colorado. The questions asked to each school were, "What percentage of your schools reported any violent incidents, any serious violent incidents, incidents of rape, incidents of physical attack with a weapon, robbery, theft or vandal, and physical attack without a weapon occurred in the 1996-1997 school year?" (Kennedy, 2003). The findings of the questionnaire are pointed. Three point nine percent of high schools with less than three hundred students reported a serious violent incident happened in their school in the year 1996-1997. Continuing in the study, 2.5% of schools with 300-999 students reported a serious violent incident happened in their school building that same year. The numbers jump dramatically in the next bracket as 32.9 % of schools with over 1,000 students reported a serious violent incident (Kennedy, 2003). These numbers represent the entire state of Colorado and the students' therein safety. The study also indicated that the largest schools that had the most number of incidents reported also employed the greatest number of policemen and security personnel to patrol the halls (Kennedy, 2003). The cure to school violence seems to come from the relationship between students and teachers. If a student is able to fall between the cracks of the school society, then his or her problems can be allowed to escalate to the point where violence manifests itself within the school walls. On the other hand, those smaller schools where the students know each other more intimately and the teachers know their students by face and name, if a problem arises will have a greater chance at being resolved in a non-violent manner.

9. Class size

Borland, Howsen, and Trawick (2005) reviewed the literature on class size and found that the effect of *class* size on student achievement, the results of attempts to empirically identify the relationship between the variables class *size* and student achievement are mixed at best. The authors state that there are four factors that have a relationship on class size: (1) the use of a student/teacher ratio as the measure of class *size* resulting in measurement error; (2) the estimation of a mis-specified model resulting from the failure to control for family effects (i.e., student innate ability); (3) the general failure to take into account the endogeneity of class size with respect to student achievement; and (4) the employment of an incorrect functional form when specifying the relationship between class size and student achievement. Borland, Howsen, and Trawick found that the relationship between class size and student achievement is not only non-linear, but non-monotonic.

While Borland, Howsen, and Trawick (2005) did not find a definitive answer to class size as a promoter of student learning Pedder (2006) sights Blatchford and Mortimore's conclusion that a major problem with class size research was the lack of detailed studies of complex classroom processes that might mediate class size effects on pupils' learning. Pedder provides theoretical models of relationships between class size, classroom processes and pupils' learning. The author recommends incorporating sophisticated qualitative methods in order to adequately understand and represent the kinds of teacher and pupil expertise involved in promoting and maximizing opportunities for high quality learning in different large and small class contexts in primary and secondary schools.

10. Schools within Schools

Hart (2006) states large public schools are great for kids who are star athletes, talented performers, superior students, or are socially gregarious. However, most kids do not fit into these categories. It is easier to provide attention to these kids in a smaller high school. The Gates Foundation and the Michael and Susan Dell Foundation are questioning mega schools California, in the academic year 2003-2004 led the nation with 25 mega schools having more than 4,000 students. Texas had 6 mega schools. The author notes that mega schools are into "schools within a school." Hart believes that big urban and suburban districts are going to have to offer a menu of smaller high schools, theme high schools (such as a girls' school), or schools within a school based on career tracks (for instance, high tech) if they are to perform their mission of educating every student.

The American School Board (2006) describes how to divide an entire high school into smaller learning units. Using the Colorado Children's Campaign the article lists essential ingredients of small school reform that includes strong principal leadership, research-based school designs with an alignment between school culture and classroom practices, at least one year of planning time for principals and teachers, support for high-quality professional development, high expectations with flexible supports for students, personalized advising for every student, and high-quality data and accountability systems.

Steinberg and Allen (2002) report that the conversion of large urban high schools into small, focused learning centers is gaining currency as an education reform strategy. They authors provide a guide to creating small learning communities for blending youth development approaches with contextual and authentic learning to create effective learning environments.

DeJong and Locker (2006) look at a planning pattern of balancing small school goals with big school traditions and efficiencies. This planning concept goes side by side with educational research that shows students learn better when they feel safe and linked to responsible adults, when they have access to role models, and when they are well known by teachers and administrators.

11. Small Schools

Gerwetz (2007) confirms the value of the New York city's strategy of opening small schools. Many of the large high schools they replaced graduated fewer than 40 percent of their students. However, there is a need to fortify the high school curricula.

Hylden (2005) looked at the reasons why small schools have better academic achievement than large schools. The author then looked at North Dakota (ND) academic achievement data that showed ND small schools outperform ND large schools.

O'Neil (1996) says the consolidation of small school boards during the 1960s and 1970s has become a top heavy bureaucratic nightmare in both Canada and the United States. Educators in other countries, particularly Australia, Great Britain, and New Zealand, have come to the same conclusion. The author concludes movement to small schools will not work until there is a change of culture, there is a true divesting of power and restructuring must be taken seriously.

Black (2006) cites Paul Abramson, a consultant who advises school districts on facilities and planning, small schools can provide an enriched curriculum on par, or nearly on par, with large schools. It is said that the critical factor is how principals and teachers organize and manage instruction. The author discusses economies of scale and the relationship between school size and student achievement as part of the equation when determining school size.

Ancess (2008) states that in small schools relationships between adults and students are close. Making a large school smaller has nothing to do with increasing learning if the only change is size. We must move the conversation from size to substance … look at how schools use their size to reach kids.

Ancess (2008) speaks to reaching kids. David (2008).believes the discussion on class and school size is not addressing a key element in education. All the current efforts are on school and class size and the other issues raised earlier in the paper. To reach kids only a substantial investment in teachers will provide school improvement. The investment in teachers should be directed toward personalization, relevance and rigor of coursework and teacher collaboration those aspects of reaching kids.

12. Small is Not Better

As in any discussion there are always two sides. Wainer and Zwerling (2006) state there is evidence that smaller schools do not improve student achievement. The authors see a "faulty logic of inference" that while many high-performing schools are smaller, you can not deduce that being small means providing a better-quality education

Lay (2007) uses the results of a nationwide survey to challenge the effect of school size on adolescent participation in school activities and volunteering. The author believes these outcomes are important because they are related to adulthood participation. However, the survey results show limited support for smaller schools.

Mertens, Flowers, and Mulhall (2001) studied 140 Michigan middle schools and found there is no simple answer to the school size issue. The authors did find teaming makes smaller schools better and larger schools smaller.

13. Conclusion

When examining the evidence, the question of what school size is optimal for success, perhaps the best answer is another question or two: Where can students have the opportunity to work closely with their teachers, score higher on standardized tests, feel safe in the schools and confident enough to get involved in extracurricular activities? Where can minorities be placed so that they benefit most and the cost per student is most efficient? Where do teachers and administrators enjoy a mutually beneficial working relationship and thus a greater responsibility to their students? The answer to all of these questions, is still a work in progress.

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